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<p>(21) International Application Number: PCT/US83/01558 (22) International Filing Date: 30 September 1983 (30.09.83) (31) Priority Application Number: 429,064 (32) Priority Date: 30 September 1982 (30.09.82) (33) Priority Country: US (71)(72) Applicant and Inventor: CATALANO, Frank, A. [US/US]; 8201 South West Fourth Court, North Lauderdale, FL 33068 (US). (81) Designated States: AT (European patent), BE (European patent), CH (European patent), DE (European patent), FR (European patent), GB (European patent), JP, LU (European patent), NL (European patent), SE (European patent).</p>		<p>Published <i>With international search report.</i></p>
<p>(54) Title: SEAT BELT BUCKLE COVER</p> <div data-bbox="574 1180 1117 1495" data-label="Image"> </div> <p>(57) Abstract</p> <p>In a vehicle seat belt passenger restraining system, a seat belt buckle cover for preventing younger children restrained thereby from accidentally or otherwise releasing the seat belt buckle. One embodiment includes a cover (38) attachable to the seat belt buckle, the cover having an aperture (36) in the top of the cover (38) for finger access to the seat belt release button. A further modification or alternate embodiment is the addition of a collapsible cover (46) to reduce the size and bulk of the buckle/cover when the seat belt is not in use. Another embodiment of the cover may include a sliding door (22) normally biased closed over the aperture, the bias means sized to prevent younger children from overcoming same and opening the sliding door (22). An optional feature for versatility in adapting this invention to various seat belt buckle sizes is a laterally positionable aperture (80) through the cover (72) to insure proper alignment and finger access between aperture (80) and buckle release button. Optionally attached to the cover (31) directly beneath the aperture may be a second spring-tensioned button (39) operably positioned above the seat belt release button for controlling variable increased force required to release the buckle button. This optional second button embodiment may include a rotatable hood (47) over the finger access aperture, the scoop-shaped hood (47) for allowing only sideways finger access to this second button (39).</p>		

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SEAT BELT BUCKLE COVER

DESCRIPTION OF THE DRAWINGS

20 Figure 1 is a top plan view of a seat belt buckle of conventional design having a push-button for releasing the buckle;

 Figure 2 is a longitudinal section taken along the line 2--2 in Figure 1 and showing the buckle in simplified form schematically;

25

 Figure 3 is a longitudinal sectional view showing in full lines a first embodiment of the present invention mounted on the seat belt buckle of Figure 1, which is

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shown in phantom in Figure 3;

Figure 4 is a cross-section taken along the line 4--4 in Figure 3;

5 Figure 5 is a fragmentary cross-section taken along the line 5--5 in Figure 4;

Figure 6 is a top view of one embodiment of a protective cover made according to this invention;

Figure 7 is a partial sectional top view of the embodiment of this invention shown in Figure 6;

10 Figure 8 is a partial sectional side elevation view of the embodiment of this invention shown in Figure 6;

Figure 9 is a partial sectional and elevational view of the embodiment of this invention shown in Figure 6 taken through D-D;

15 Figure 10 is a side elevation sectional view of another alternate embodiment of this invention;

Figure 11 is a side elevation sectional view of another alternate embodiment of this invention;

20 Figure 12 is an end elevation sectional view of the alternate embodiment of this invention shown in Figure 11 through Section E-E;

Figure 13 is a side elevation sectional view of another alternate embodiment of this invention;

25 Figure 14 is an end elevation sectional view of the embodiment of this invention shown in Figure 13 through Section F-F;

Figure 15 is a plan sectional view of the embodiment of this invention shown in Figure 13 through Section N-N;

30 Figure 16 is a side elevation sectional view of another alternate embodiment of this invention;

Figure 17 is an end elevation sectional view of the embodiment of this invention shown in Figure 16 through Section H-H;

35 Figure 18 is a longitudinal sectional view showing a second embodiment of this invention mounted on a seat belt buckle as shown in Figure 1;

Figure 19 is a cross-section taken along the line

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7--7 in Figure 18;

Figure 20 is a cross-section taken along the line

8--8 in Figure 18;

Figure 21 is a view similar to Figure 18 but showing
5 the operating lever in different positions of adjustment;

Figure 22 is a fragmentary cross-section taken along
the line 10--10 in Figure 21;

Figure 23 is a top plan view of the device as shown
in Figure 18 with parts broken away for clarity;

10 Figure 24 is a longitudinal sectional view showing a
third embodiment of this invention mounted on a seat belt
buckle as shown in Figure 1;

Figure 25 is a cross-section taken along the line
13--13 in Figure 24;

15 Figure 26 is a cross-section taken along the line
14-14 in Figure 24;

Figure 27 is a fragmentary cross-section showing
the adjusting screw in this embodiment displaced so that
the operating lever can be adjusted to a new position;

20 Figure 28 is a top plan view of a fourth embodiment
of this invention, with parts broken away for clarity;

Figure 29 is a longitudinal section taken along the
line 17--17 in Figure 28;

25 Figure 30 is a longitudinal sectional view showing a
fifth embodiment of this invention mounted on a seat belt
buckle with a shape different from the one shown in Figure
1;

Figure 31 is a bottom plan view of the assembly shown in
Figure 30;

30 Figure 32 is an end elevation taken from the right end
of Figure 30;

Figure 33 is a top plan view of a sixth embodiment of
this invention, with parts broken away for clarity; and

35 Figure 34 is a longitudinal section taken along the
line 22--22 in Figure 33.

Before explaining the disclosed embodiments of the
present invention in detail it is to be understood that

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the invention is not limited in its application to the details of the particular arrangements shown since the invention is capable of other embodiments. Also, the terminology used herein is for the purpose of description and not of limitation.

DETAILED DESCRIPTION

Figure 1 shows a car seat belt buckle 25 of conventional design having a socket 26 attached to one segment 27 of the seat belt and a tongue 28 attached to the opposite segment 29 of the seat belt. The tongue 28 is slidably insertable into and removable from the socket 26 at the right end of the latter in Figures 1 and 2. When fully inserted, the tongue 28 is locked in the socket 26 in a known manner until a release button, shown schematically at 30 in Figures 1 and 2, is pushed in, as indicated by the arrow in Figure 2.

The present invention is directed to an attachment for the seat belt buckle socket 26 which makes it difficult or impossible for a small child to operate the release button 30.

FIGURES 3-5

In the embodiment shown in Figure 3-5, this attachment comprises a substantially rigid housing 31 which extends across the front of the seat belt buckle socket 26 (where the latter's release button 30 is exposed), and a pair of flexible straps 32 and 33 (Figure 4) which are affixed to opposite sides of housing 31 and extend from it on opposite sides of buckle 25 to an overlapped position behind buckle 25. The straps have interlocking teeth 34 which enable them to releasably embrace the socket 26 tightly enough to hold the housing snugly against the front of the socket.

The housing has an annular internal wall 35 extending between its inner end wall 36, which engages the front of socket 26, and its outer end wall 37. The annular wall 35 defines a cylinder in which an internally screw-threaded ring 38 is slidable. The outer end face 46 of ring 38 (i.e.

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the face away from the seat belt buckle) engages an annular transverse internal shoulder at the outer end of this cylinder. As shown in Figure 5, the ring 38 has radially outwardly projecting ribs 38a and 38b on opposite sides which are slidably received in complementary grooves formed in the internal housing wall 35 to prevent the ring from turning. Ring 38 threadedly receives an externally screw-threaded plunger 39 having a central recess 40 (Figure 3) which faces toward, and is aligned with, the release button 30 on the seat belt buckle. A compression coil spring 41 encircles a pin 42 inside the plunger recess 40. Pin 42 has a reduced diameter stem 43 carrying a spherical ball 44 on its inner end which is engageable with the release button 30 of the seat belt buckle. A flat plate 45 carried by housing 31 near the inner end of its annular internal wall 35 is engaged by the inner spring 41. This plate has a central opening through which stem 43 extends.

Spring 41 is under compression between plate 45 and plunger 39 and it biases plunger 39 outward, away from release button 30. Plunger 39 must be pushed in to force the ball 40 on its inner end against the release button 30 to release the seat belt buckle. The spring force which opposes such displacement of plunger 39 is determined by the screw-threaded adjustment of plunger 39 in ring 38. This adjustment can be changed by rotating plunger 39 in the ring 38 to either decrease or increase the spring force which must be overcome to depress the buckle push button 30.

A cap 47 is mounted on the outer end wall 37 of housing 31 to make it more difficult for a child to place his or her finger on plunger 39. This cap has a curved outer wall which extends across the outer end of plunger 39 and permits finger access to the plunger only at an opening 48 at one side. The cap has a flat base 49 seated snugly in a complementary groove in the outer wall of housing 31.

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Preferably, cap 47 is of deformable and resilient plastic material and its opposite sides are sufficiently flexible that they can be squeezed together to enable a snap-in insertion of the base 49 of the cap in the housing groove.

5 To depress the release button 30 of the seat belt buckle 25, the user must insert his or her finger through the side opening 48 in cap 47 and push in on the exposed outer end of plunger 39. The inward movement of plunger 39 (and thus the operation of the release button) is resisted
10 by the compressive force on spring 41, as determined by the screw-threaded adjustment of plunger 39 with respect to ring 38. Thus, for example, the spring adjustment might be such that a small child would not be strong enough to push in the plunger 39 for operating the release button
15 30.

Figures 6 through 9 show one embodiment of the present invention, this embodiment optional to only an aperture in the top of the cover (not shown) having as its principle purpose placing a movable sliding door 22
20 over the release button thus closing the aperture 23 in the top of the cover 26. This slider door 22 then prevents release of the button until it is moved to its open position as shown. The slider door 22 is held over the release button by a cover 26 which is held to the buckle by set
25 screws 28. The door is made slidable by mating tracks 26' on the inside side walls of the cover 26. The sliding door 22 is movable by first pressing flange 24 in direction P1 which disengages detent 25 from the mating pocket in the cover 26. Bias means 30 serve to keep the sliding
30 door 22 and therefore, aperture 23, normally closed over the buckle release button and must be overcome in order to open the sliding door 22.

A second embodiment of this invention is shown in Figure 10. The cover 32 in this embodiment includes an
35 aperture 34 in the end of the hollow cover which is sized to allow finger access to depress the release button in the direction of the arrow. The geometry involved in

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positioning aperture 34 thusly in relation to the release button and the additional finger strength required to release the button serve to make this embodiment also "child-proof". The cover 32 is held onto the seat belt buckle by forcibly distorting the sides of the cover in direction S over the buckle so that a recess or pocket 35 in the cover fits around a mating buckle edge contour.

Figures 11 and 12 depict the third embodiment of this invention which is generally intended to provide a finger access aperture 36 in the top of the cover 38 which is spaced apart from the buckle release button such that smaller children would not be able to reach the release button. As previously described, such a cover in its simplest form, (not shown) would provide a fixed gap between the aperture 36 and the release button by having integral continuous sides. This embodiment as shown provides the added feature of collapsibility when the seat belt buckle is disengaged from the tongue to reduce the overall bulk of the cover. Collapsibility is made possible by telescoping the inner section 38" of the cover 38 into the outer section 38' of the cover. Mating detents 40 provide a part of the means for holding the cover in position away from the release button. The other element providing cover positioning is in the integration between the tang 42, a part of the cover outer portion 38' and the tongue 20 of the seat belt. In order for the seat belt tongue 20 to be engaged into the seat belt buckle 12, the cover upper portion 38' must be pulled to the extended position in direction F, thus moving tang 42 out of the way of the tongue mating opening 44 in the seat buckle. Upon releasing the seat belt halves, the cover may be collapsed in direction G. The lower portion 38" of the cover 38 is attachable to the seat belt buckle by set screws 28'.

Another alternate embodiment of the instant invention is shown in Figures 13, 14 and 15 having a cover inner portion 48 attachable to the buckle and a cover

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outer portion 46 having a finger access aperture 49 therethrough. These cover portions 46 and 48 telescope in relation to one another on mating guides 50 and 52. By
5 applying force to the sides of the cover upper portion 46 in direction S, T-shaped tangs 54 and 58 integral to the inner surface of the cover upper portion 46 are disengaged from a particular mating slot 56. When said disengagement
10 is effected, the cover upper portion 46 may be repositioned up or down in direction Q, varying the distance between aperture 49 and the buckle button. After a new position is selected, release of the sides of the cover upper portion causes the T-shaped tangs 54 and 58 to re-engage another
15 particular mating slot 56. This is the preferred means for providing cover height adjustability when the finger access aperture is through the top of the cover.

Another alternate embodiment of the invention, shown in Figures 16 and 17, includes an aperture 66 in the
20 top of the cover 60. This embodiment also includes a telescoping inner cover section 62 which attaches to the buckle by stretching or flexing over the buckle and snapping into place at 63. This inner cover 62 telescopes within the outer cover 60 in the direction of the arrow
25 and is releasably and adjustably locked at the desired spacing between aperture 66 and the buckle release button by selection of one of a plurality of holes 72 through which to insert thumb screw 64. The threaded portion of the thumb screw is then tightened into the lower cover at
30 74 to provide the relative position-locking function. Washer 64' prevents complete withdrawal of the thumb screw to prevent loss of same during light adjustment.

FIGURES 18-23

Figures 18-23 show a fourth embodiment of the pre-
35 sent invention. It comprises a hollow housing having a generally flat outer wall 50, opposite side walls 51 and 52, (Figure 19) which engage the belt buckle socket 26 from opposite sides, opposite end walls 53 and 54 (Figure 18) and a hinged inner wall 55. This housing is

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open at its opposite ends to pass the tongue 28 and the seat belt segment 27, as shown in Figure 18. The inner wall 55 is attached to side wall 51 at a reduced corner 56 which is flexible enough to provide a hinged connection between them. The opposite edge of inner wall 55 has a transverse, deformable and resilient lip 57 which frictionally engages the inside of side wall 52 when the inner wall is in its closed position, shown in full lines in Figure 19. As shown in Figure 18, the inner wall 55 covers only part of the length of housing between its end walls 53 and 54. As shown in this Figure, the inner wall 55 engages the inside face of the socket 26 of the seat belt buckle.

To the right of the inner wall 55 in Figure 18 the housing is formed with a rigid first internal wall 58 extending longitudinally inward from the end wall 54 and between the opposite side walls 51 and 52. The internal wall 58 extends parallel to the outer wall 50 of the housing and it terminates in an inner edge 59 (Figure 18) which engages one end of the socket 26 of the seat belt buckle when the opposite end of this socket engages the inside of the opposite end wall 53 of the housing. Wall 58 has three parallel openings 60, 61 and 62 at progressively greater distance from its inner end face 59.

The housing also is formed with a rigid second internal wall 63 (Figures 18 and 21) extending perpendicularly inward from its end wall 53. This second internal wall 63 engages the outer face of the socket 26 of the seat belt buckle on the left side of the latter's release button 30 in Figure 18.

On the opposite side of the release button 30 the housing has aligned third and fourth rigid internal walls 64 and 65 (Figure 19) extending inward from the side walls 51 and 52 respectively, and terminating short of one another. These internal walls are formed with three aligned semi-circular grooves each, as shown in dotted lines at 66, 67 and 68 in Figures 18 and in full lines in Figure 23.

The housing receives a pivoted operating lever 70

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attached to a cylindrical cross pin 71, which may be rotatably seated in either the aligned grooves 66 or the aligned grooves 67 or the aligned grooves 68 in walls 64 and 65. The operating lever 70 has a head with a grooved outer face at 72 where it projects through an opening 73 in the outer wall 50 of the housing for engagement by a person's finger. Inward from this outer face the lever presents an inner end projection 74 which engages the release button 30 of the seat belt buckle when the head of the lever is pushed in. To the left of the opening 73 in the housing's outer wall 50 in Figure 18, the lever terminates in an end segment 75 which normally engages the inside face of this wall of the housing.

To the right of its pivot pin 71 in Figure 18, the lever 70 is formed with a screw-threaded opening 76. An adjusting screw 77 is threadedly received in this opening, presenting a slotted head 78 on its outer end which is located in an opening 79 in the outer wall 50 of the housing. At its inner end the adjusting screw has a reduced diameter cylindrical stem 80 which is snugly but slidably received in one of the openings 60, 61 or 62 in the internal wall 58 of the housing. When the adjusting screw is received in opening 60, the pivot pin 71 of lever 70 will be in grooves 66, as shown in full lines in Figure 21. When the adjusting screw is in opening 61, the lever's pivot pin 71 will be in grooves 67, as shown in Figure 18. When the adjusting screw is in opening 62, the lever's pivot pin 71 will be in grooves 68, as shown in phantom in Figure 21. A snap ring 81 on the inner end of stem 80 engages the inside face of wall 58 (the bottom face in Figure 18) to hold the adjusting screw 77 captive.

The operating lever 70 is of suitable resilient plastic material and due to its elongated shape it is flexible when a person presses his or her finger against its exposed head 72. The lever 70 acts as a spring

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which opposes such deflection, depending upon how much the lever is pre-stressed. This depends upon the screw-threaded adjustment of adjusting screw 68. For a given setting of the adjusting screw, the spring force of lever 70 which opposes its inward movement for operating the release button 30 of the seat belt buckle will be greater when the pivot pin 71 is in the grooves 68 and least when the pivot pin 71 is in grooves 66.

FIGURES 24-27

Figures 24-27 show a fifth embodiment of the invention which is generally similar to the embodiment of Figures 18-23. Elements of this fifth embodiment which correspond to elements of the embodiment shown in Figures 18-23 are given the same reference numerals with an "a" suffix added, so that a detailed description of these elements need not be repeated.

As shown in Figure 25, the housing has a separately formed inner piece 90 with short flexible and resilient flanges 91 and 92 on opposite sides which fit inside the respective side walls 51a and 52a of the outer piece of the housing. These flanges have tapered end teeth 93 and 94 which seat in corresponding grooves in the side walls 51a and 52a when the inner piece 90 is snapped into the outer piece of the housing. The opposite ends of the inner housing piece 90 are open to pass the tongue 28 of the seat belt buckle and the seat belt segment 27.

The operating lever 70a has a pivot pin 71a on opposite sides which, as shown in Figure 25, engages the flat outer surfaces of respective internal walls 64a and 65a of the outer piece of the housing. These internal walls at their adjacent ends have inwardly projecting flanges 64a" and 65a", respectively, which engage the outer face of the socket 26 of the seat belt buckle.

The internal wall 58a of the outer piece of the housing is joined at its inner end to internal walls 64a and 65a. As shown in Figure 24 internal wall 58a is formed

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with three semi-circular grooves 93, 94 and 95 which face inwardly, i.e., toward the seat belt buckle. These grooves are spaced apart in succession away from the lever pivot pin 71a. The adjusting screw 77a carries a cross pin 96 near its inner end which is seated in a selected groove 93, 94 or 95. Figure 24 shows it seated in the middle groove 94.

The internal wall 58a is formed with an elongated slot 97 (which loosely receives the inner end of the adjusting screw 77a and enables it to be adjusted to position its cross pin 96 in any one of the grooves 93, 94 and 95.

The outer wall 50a of the outer housing piece has semi-circular grooves 103, 104 and 105 on the inside which are aligned respectively with the grooves 93, 94 and 95 in the internal wall 58. The adjusting screw 77a carries a cross pin 106 which may be seated in any one of the grooves 103, 104 or 105.

By turning the adjusting screw 77a inward (Figure 27) its cross pins 96 and 106 may be moved out of the respective grooves (e.g., 94 and 104) which receive them, after which the adjusting screw can be slid along the slot 79a in the outer wall 51a and the slot 97 in the internal wall 58a to position its cross pins at a selected aligned pair of grooves (e.g., 93 and 103, or 95 and 105). Then the adjusting screw can be turned in the opposite direction until its cross pin seat in the respective grooves.

The longitudinal position of the adjusting screw 77a determines the spring force which the flexible and resilient operating lever 70a exerts to oppose an inward displacement of its head 72a for depressing the release lever 30 on the seat belt buckle.

Additional adjustability is provided by an adjusting screw 98 which is threadedly adjustable in a screw-threaded opening 99 formed in the operating lever 70a in alignment with the release button 30. The inner end of this adjusting screw is rounded and it projects inward

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beyond the operating lever for engagement with the release button 30.

FIGURES 28 and 29

A sixth embodiment of this invention is shown in Figures 28 and 29, where elements which correspond to elements in the embodiment of Figures 18-23 are given the same reference numerals but with a "b" suffix added.

As shown in Figure 29, the socket 26b of the seat belt buckle has a different shape from the socket in the preceding embodiments, presenting a convex outer wall where the release button 30b is located. The outer wall 50b of the housing of the present attachment has a somewhat similar shape. The inner wall 55b of this housing is hinged at 110 to the opposite side walls of this housing near the housing and wall 53b. The opposite end of inner wall 55b presents a curved lip 111 for snap-on engagement with the rounded inner edge of end wall 54b. The socket 26b of the seat belt buckle is engaged snugly between the hinged inner wall 55b and an internal rib 112 of the housing which extends inward from the outer wall 50b.

The flexible and resilient operating lever 70b about midway along its length carries a pivot pin 71b which is rotatably received in ears 113 and 114 (Figure 28) which extend inward from the outer wall 50b of the housing, as shown for the ear 114 in Figure 29.

On the opposite side of its pivot 71b from its head 72b, the operating lever is engaged by a stop 115 which is adjustably positioned along an elongated slot 79b in the outer wall 50b of the housing. This stop comprises an internally screw-threaded plastic socket 116 located between lever 70b and the inside of the outer housing wall 50b, bolt 117 having a screw-threaded stem threadedly received in socket 116 and a slotted head outside the outer housing wall 50b, and a flat washer 118 engaged between the bolt head and the outside of the outer housing wall. After loosening the bolt 117, the stop may be slid to any

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selected position along the slot 79b--and then clamped in that position by tightening the bolt.

5 The position of stop 115 with respect to the lever pivot 71b determines the spring force which the flexible and resilient operating lever 70b exerts in opposition to an inward displacement of its head 72b for depressing the release lever 30b on the seat belt buckle. The farther the stop 115 is from the lever pivot, the less will be the spring force which the lever exerts because
10 of the flexibility of the lever 70b between its pivot and stop 115.

FIGURES 30-32

A seventh embodiment of the present invention is shown in Figures 30-32. This embodiment is generally similar to the embodiment of Figures 28 and 29, and corresponding elements are given the same reference numerals as in Figures 28 and 29 but with a "c" suffix.
15

As shown in Figure 30, the socket 26c of the seat belt buckle has an opening in its inner face 120 which receives segment 27 of the seat belt. The inner wall 55c of the housing of the present invention is hinged at 11a to the housing end wall 53c and at this end it presents a rectangular opening 121 which passes the tongue 28 of the seat belt buckle. The opposite end of the inner wall 55c is inwardly offset at 122 for passing the seat belt segment 27c and terminates in a rounded bead 123. To the right of the socket 26c of the seat belt buckle the housing presents internal ribs 132 and 133 which extend longitudinally from the right end wall of the housing, as shown in Figures 30 and 31.
20
25
30

At its right end in Figure 30 the housing presents a generally cylindrical segment 124 which receives a coil spring 125. The inner end of this spring bears against the end of the operating lever 70c which is on the opposite side of the lever pivot 71c from the head 72c which is engaged by the user's finger. At this end the lever presents a circular protrusion 126 which is snugly encircled
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by the inner end of spring 125. The outer end of spring 125 engages a flange on a nut 127.

5 Bolt 117c has its screw-threaded stem threadedly received in nut 127. The bolt is rotatably mounted in an opening 128 in the outer wall 129 of housing segment 124. Washers 130 and 131 hold the bolt captive in this housing wall. By turning bolt 117c in one direction or the other, the nut 127 is displaced longitudinally of spring 125 to either increase or decrease its compression. In this way, 10 the spring force opposing the inward movement of head 72c on the operating lever can be adjusted to suit the user's requirements.

FIGURES 33 and 34

15 Figures 33 and 34 show an eighth embodiment of the invention, which may be used with a seat belt buckle as shown in Figures 3-5. Elements of this embodiment which correspond to elements in the embodiment of Figures 3-5 are given the same reference numerals with a "d" suffix added.

20 The housing is of two piece construction, with a flat inner wall 55d which snaps into the other piece of the housing as shown in Figure 34. At its outer side the housing presents an outwardly extending frustoconical dome 140 having a central opening 141. At the inside of this opening the housing dome presents a generally cylindrical 25 bore 142 of larger diameter than the opening. As shown in Figure 33, at this bore the housing presents several rounded, radially inwardly projecting, longitudinal ribs 143.

30 An annular nut 144 is slidably received in housing bore 142. Near its outer end this nut has a laterally outwardly projecting, annular, peripheral flange 145 with rounded recesses 146 (Figure 33) which receive the ribs 143. This flange has a sliding fit in the housing 35 bore and the ribs 143 prevent the nut from turning in the bore.

A coil spring 147 is engaged under compression

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between the nut flange 145 and an annular plate 148 which has a snap fit on the housing at the inner end of bore 142.

The nut 144 has a screw-threaded opening 149 which threadedly receives a screw-threaded plug 150. This plug has a rounded inner end which projects through a central opening in plate 148 for engagement with the release button 30 of the seat belt buckle. The outer end of plug 150 has a screw driver slot.

To operate the release button 30, the user pushes in on the serrated outer end of nut 144. The compression spring 147 opposes such inward movement of nut 144 with a force which increases as the nut moves inward. The distance that the nut 144 travels inward before the plug 150 engages and operates the release button 30 of the seat belt buckle depends upon the screw-threaded adjustment of this plug in the nut. Therefore, the opposing force of spring 147 which must be overcome before the seat belt buckle is released also depends upon this adjustment of plug 150.

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I Claim:

1. In a vehicle seat belt passenger restraining system a seat belt buckle cover for preventing release of the seat belt by smaller children restrained thereby,
5 said seat belt buckle cover comprising:
a cover having a top portion and side portions,
said top portion having an aperture there-
through;
said aperture positioned over the seat belt
10 buckle release button;
said aperture sized to allow an adult-sized
finger to pass therethrough for contacting
and releasing the seat belt release button;
and
15 means for attaching said cover onto the seat belt
buckle;
said cover top portion spaced apart from the seat
buckle release button a certain distance
such that the fingers of smaller children
cannot release the seat belt buckle.
2. In a vehicle seat belt passenger restraining system, a seat belt buckle cover as set forth in Claim 1,
wherein:
said distance that said cover top portion is
5 spaced apart from the seat belt buckle is
adjustable.
3. In a vehicle seat belt passenger restraining system, a seat belt buckle cover as set forth in Claim 1,
wherein:
said cover is collapsible over the seat belt
5 buckle when the seat belt portions are
disengaged from one another;
said collapsibility for reducing overall size
of the seat belt buckle with said collaps-
ible cover attached thereto.
4. In a vehicle seat belt passenger restraining system, a seat belt buckle cover for preventing release

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of the seat belt buckle by smaller children restrained thereby, said seat belt buckle cover comprising:

- 5 a cover having a top portion and side portions,
at least one said side portion having an
aperture therethrough;
said at least one aperture sized to allow an
adult-sized finger to pass therethrough
10 for contacting and releasing the seat belt
release button; and
means for attaching said cover onto the seat belt
buckle;
said aperture positioned in said one side guard
15 cover such that the fingers of smaller children cannot release the seat belt buckle.

5. In a vehicle seat belt passenger restraining system, a seat belt buckle cover for preventing release of the seat belt buckle by smaller children restrained thereby, said seat belt buckle cover comprising:

- 5 a cover having a top portion and side portions,
said top portion having an aperture there-
through;
said aperture positioned over the seat belt buckle
release button;
10 said aperture sized to allow an adult-sized finger
to pass therethrough for contacting and re-
leasing the seat belt release button;
means for attaching said cover onto the seat belt
buckle; and
15 means movably attached to said cover for at least
partially occluding said aperture to prevent
finger access to the seat belt release
button.
said means movably attached to said cover movable
20 from said at least partially occluding said
aperture by finger pressure and movement of
adults.

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seat belt buckle cover as set forth in Claim 5, further comprising:

5 bias means for keeping said means for at least
 partially occluding said aperture in a
 normally closed position in relation to said
 aperture;
 said bias means sized to be overcome by normal
10 adult manual hand movement, thus allowing
 access by finger to the seat belt release
 button.

7. In a vehicle seat belt passenger restraining system, a seat belt buckle cover as set forth in Claim 1 further comprising:

5 means for laterally moving said aperture in said
 top portion of said cover in at least one
 direction;
 said means for laterally moving said aperture
 for aiding in finger access to and alignment
 with the seat belt release button.

8. In a vehicle seat belt passenger restraining system, a seat belt buckle cover as set forth in Claim 1 further comprising:

5 a hood rotatably mounted in said cover over said
 aperture;
 said hood having a laterally-facing opening for
 allowing finger access to said aperture in
 said cover and said intermediate button.

9. A protective device for attachment to a seat belt buckle having a release button which is movable inward to release the buckle, said protective device comprising:

5 a housing having means for releasably mounting
 it on the seat belt buckle;
 and an actuator mounted in said housing for movement toward the release button of the seat
10 belt buckle to move the latter inward for
 releasing the buckle, said actuator being

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resiliently biased to oppose its movement toward the release button.

10. A protective device according to claim 9 and further comprising:

means for selectively adjusting the bias on said actuator to determine the force required to move inward the release button on the seat belt buckle.

11. A protective device according to claim 9 wherein a separate spring acts on said actuator to oppose its movement toward the release button.

12. A protective device according to claim 11 wherein: said actuator is a plunger which is slidably mounted in said housing;

and said spring is a coil spring under compression against said plunger to oppose its movement toward the release button.

13. A protective device according to claim 12 wherein: said plunger comprises a ring slidably mounted

in said housing for reciprocation toward and away from the release button on the seat belt buckle, and an operating member engageable by the user's finger and screw-threadedly adjustable in said ring toward and away from the release button;

said housing presents a shoulder which is engageable by said ring to limit the latter's movement away from the release button;

and said spring acts between said housing and said operating member to bias the latter to a position in which said ring engages said shoulder.

14. A protective device according to claim 12 wherein:

said plunger comprises an operating member engageable by the user's finger and slidably mounted in said housing for reciprocation

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10 toward and away from the release button on the seat belt buckle, and a plug projecting beyond said operating member toward the release button and screw-threadedly adjustable in said operating member toward and away from the release button;

15 said housing member presents a shoulder which is engageable by said operating member to limit the latter's movement away from the release button;

said spring acts between said housing and said operating member to bias the latter against said shoulder.

15. A protective device according to claim 9, wherein said actuator is a pivoted lever.

16. A protective device according to claim 15 wherein said pivoted lever is flexible and resiliently opposes being flexed toward the release button of the seat belt buckle.

5 17. A protective device according to claim 16 and further comprising means enabling the lever pivot to be selectively adjusted toward and away from the release button to thereby change the force required to flex it toward the release button.

18. A protective device according to claim 17 wherein: said lever extends on one side of the release button of the seat belt buckle and is pivoted intermediate its length;

5 and further comprising:

means engaging said lever on the opposite side of its pivot from the release button and holding the lever against movement thereat.

19. A protective device according to claim 18 wherein: said lever has a screw-threaded opening therein on said opposite side of its pivot; and said means engaging the lever is an adjusting screw threadedly received in said opening and rotatably adjustable to vary the force

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required to flex the lever toward the release button.

20. A protective device according to claim 19 and further comprising:

5 means on said adjusting screw for engagement with said housing to prevent longitudinal displacement of said screw as it is being rotated.

21. A protective device according to claim 20 wherein: said lever carries a cross pin on which it is pivoted;

and further comprising:

5 a rigid support for said pivot pin attached to said housing and defining a plurality of grooves spaced apart in succession on said one side of the release button and each shaped and dimensioned to rotatably support
10 said pivot pin.

22. A protective device according to claim 19 wherein: said adjusting screw carries cross pins respectively located outward and inward from its screw-threaded engagement with the lever;
5 and said housing presents a plurality of grooves spaced in succession from the lever pivot for receiving said cross pins.

23. A protective device according to claim 16 wherein: said lever is pivotally mounted intermediate its length and presents a head for engagement by the user's finger on one side of its pivot;

5 and further comprising:

a stop member mounted on said housing on the opposite side of the lever pivot from said head and operatively arranged to oppose flexing movement of the lever for operating
10 the release button on the seat belt buckle.

24. A protective device according to claim 23 wherein: said stop is adjustable toward and away from the lever pivot

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to selectively vary the force required to flex the lever for operating the release button.

25. A protective device according to claim 15 wherein: said lever is pivotally mounted intermediate its length and presents a head for engagement by the user's finger on one side of its pivot; and further comprising:

a spring acting on the lever on the opposite side of its pivot and opposing movement of the lever for operating the release button on the seat belt buckle.

26. A protective device according to claim 25, and further comprising means for selectively adjusting the force exerted by the spring on the lever.

27. The device of claim 9 including means for connection to the strap of the buckle.

28. The device of claim 9 including means for connection to the protective covering of said buckle.

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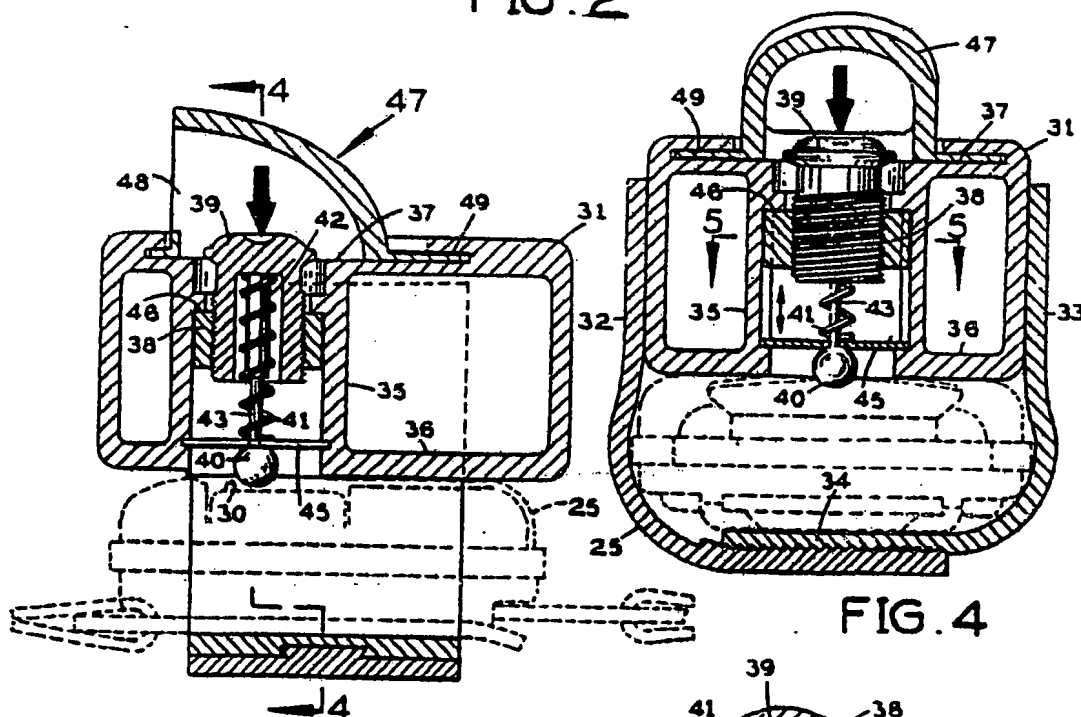
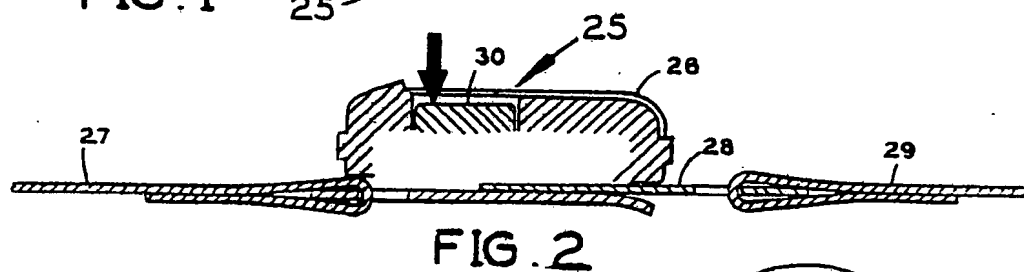
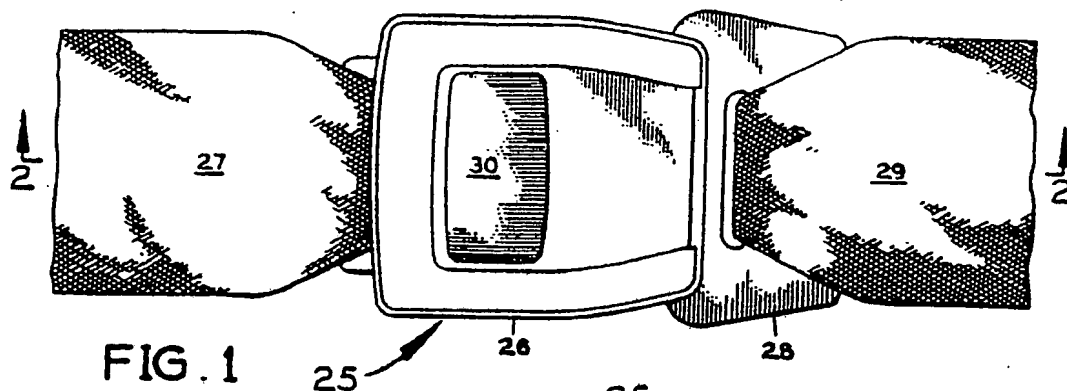
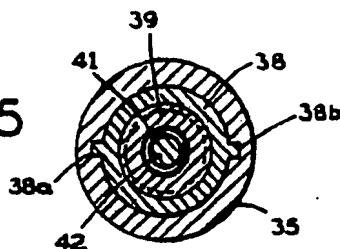


FIG. 3

FIG. 5



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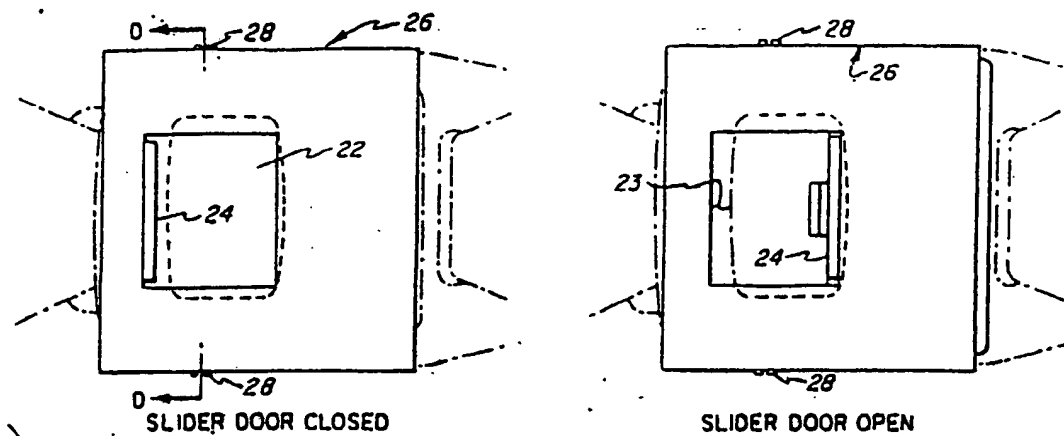


FIG. 6

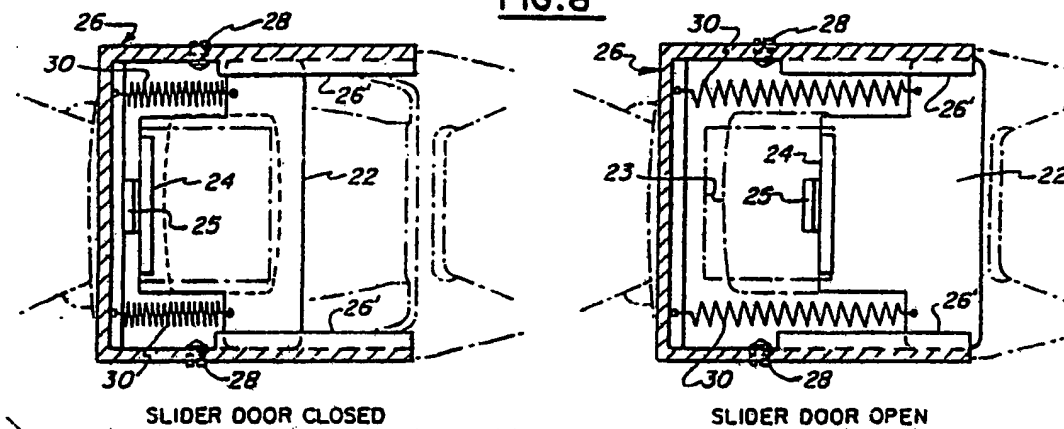


FIG. 7

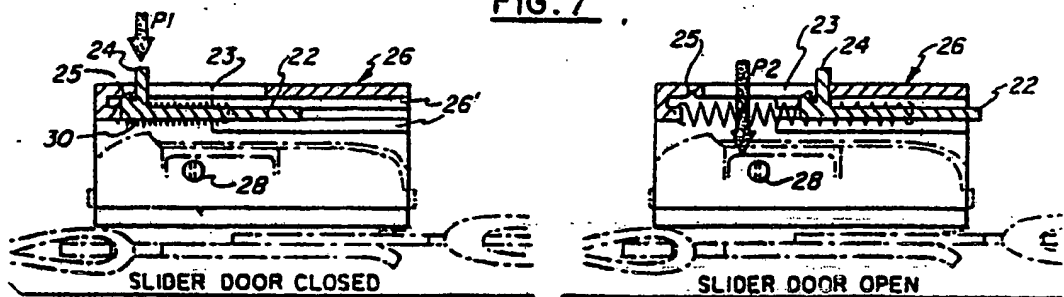


FIG. 8

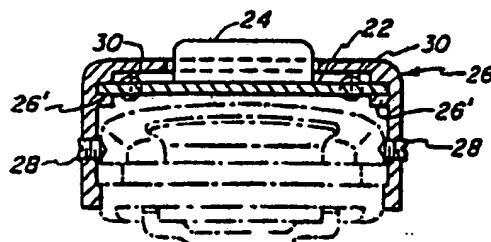


FIG. 9

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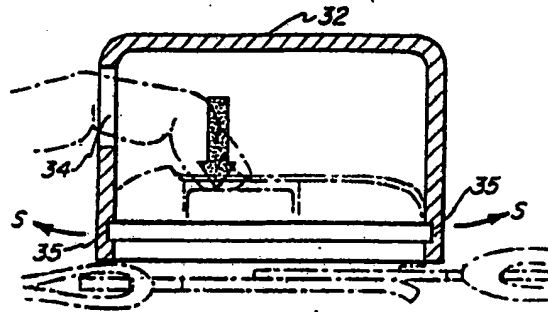


FIG. 10

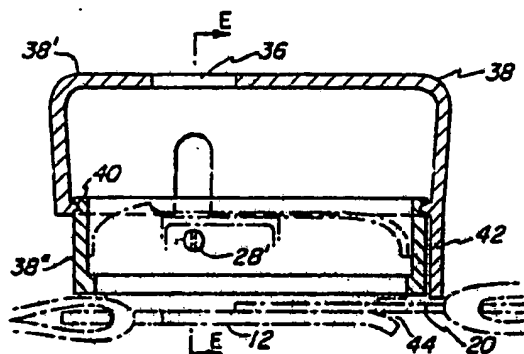


FIG. 11

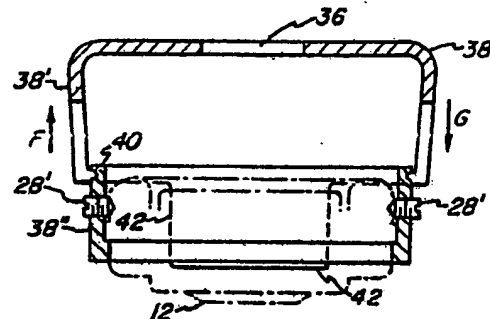


FIG. 12

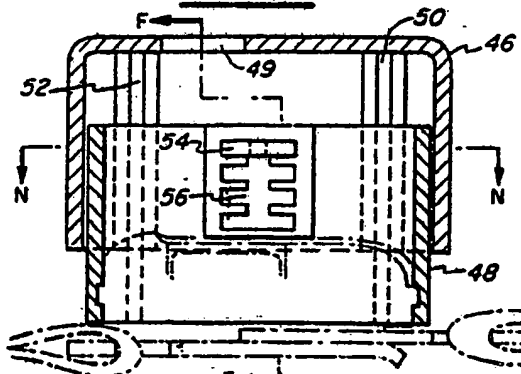


FIG. 13

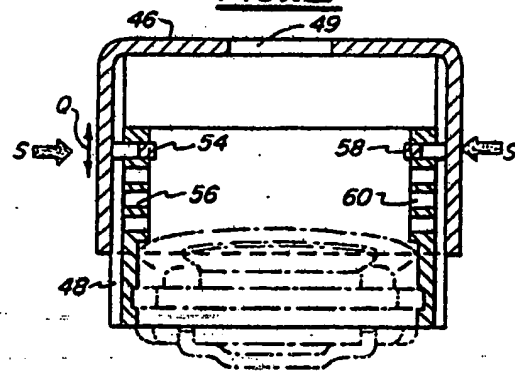


FIG. 14

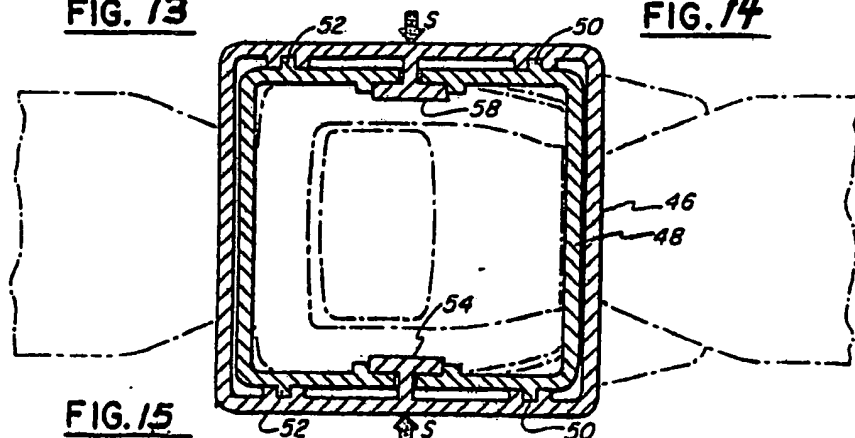


FIG. 15

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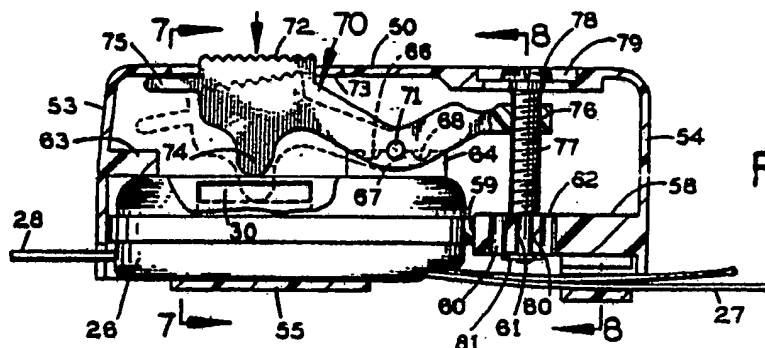
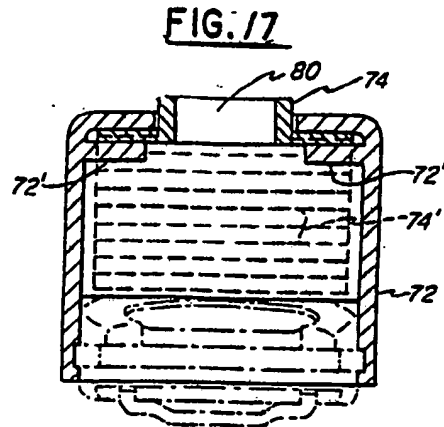
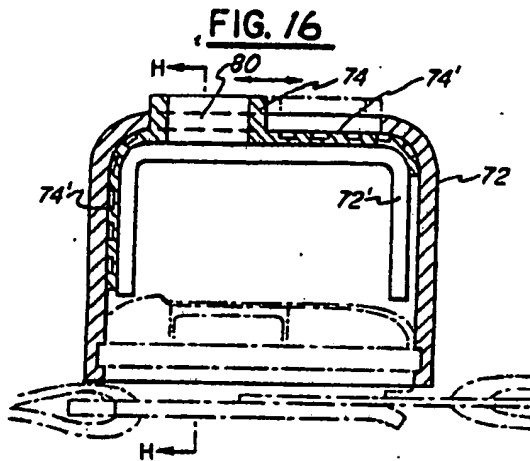


FIG. 18

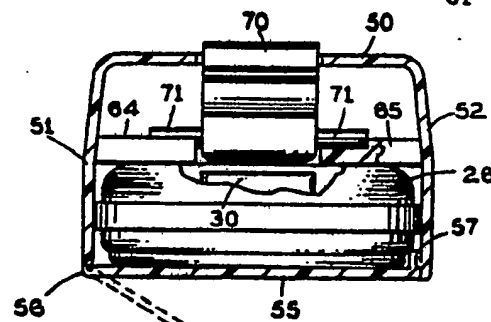


FIG. 19

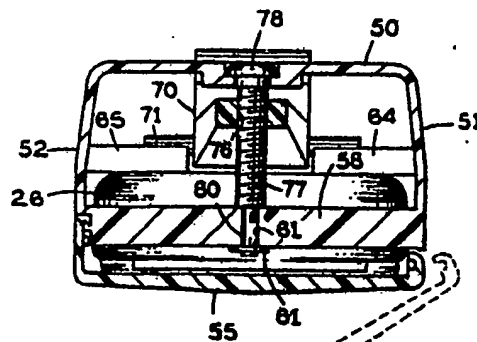


FIG. 20

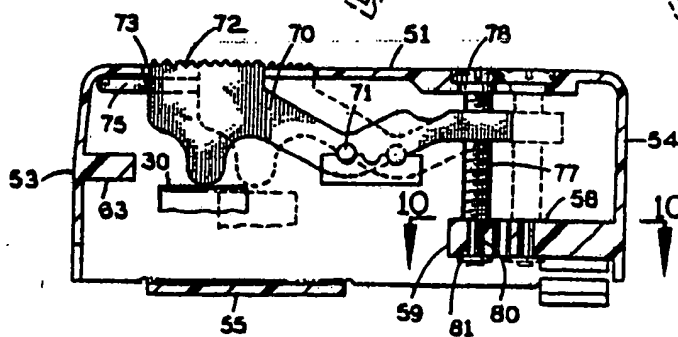
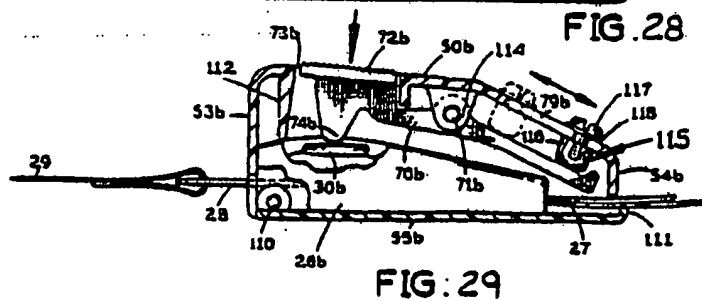
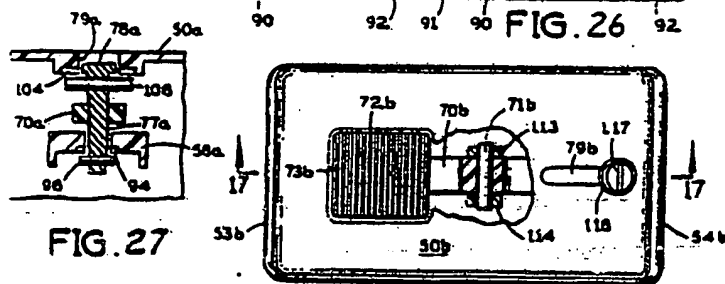
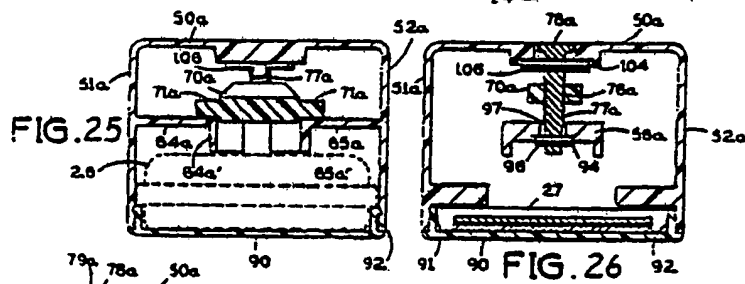
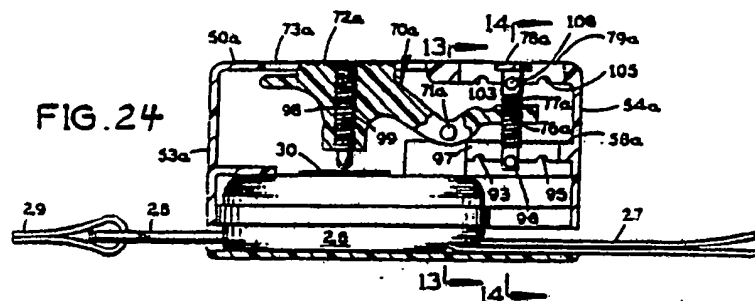
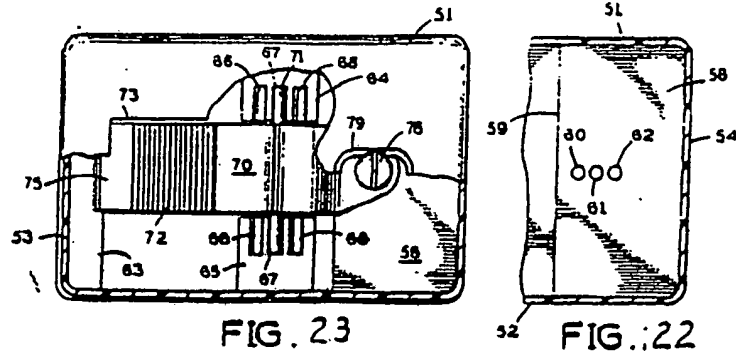


FIG. 21

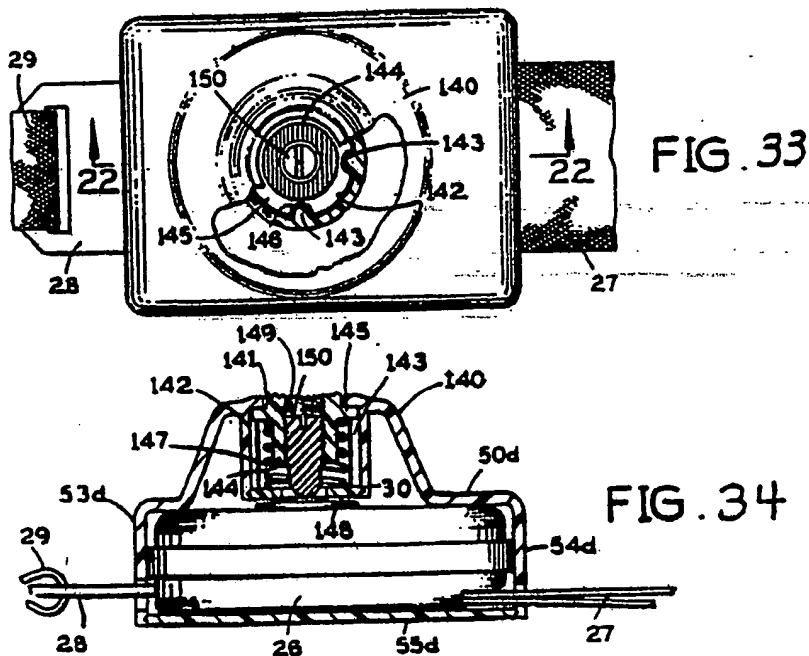
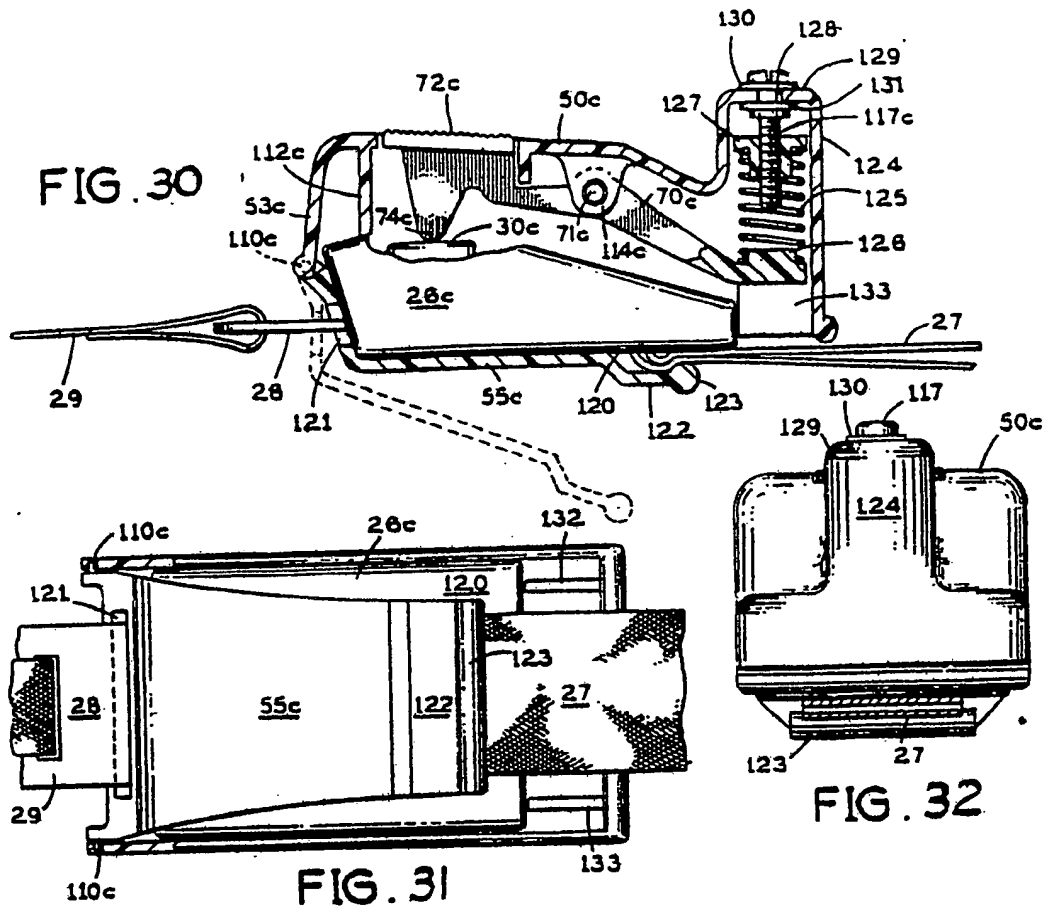
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INTERNATIONAL SEARCH REPORT

International Application No PCT/US 8 3 / 0 1 5 5 8

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ¹		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int. Cl. 3 A44B 11/00; A62B 35/00		
U.S. 24/573; 297/468		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁴		
Classification System	Classification Symbols	
U.S.	297/216, 254, 464, 468, 474, 482, D2/405, 408; 200/61.58B, 280/801, 808, 200/42R; 292/ Dig. 2, Dig. 13 Dig. 63, Dig. 65	
Documentation Searched other than Minimum Documentation to the extent that such Documents are included in the Fields Searched ⁴		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ¹⁴		
Category ⁵	Citation of Document, ¹⁴ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁸
A	US, A, 1,565,678 (Severson) 15 December 1925	1, 4
Y	US, A, 2,070,955 (Parisoe) 16 February 1937	5, 7
Y	US, A, 2,194,408 (Sluss) 19 March 1940	5
Y	US, A, 3,109,900 (Van Hook) 05 November 1963	1, 2, 4, 5, 7
Y	US, A, 3,115,269 (Rasmussen) 24 December 1963	1, 2, 4, 5, 7
A	US, A, 3,484,908 (Lamb) 23 December 1969	1, 4
A	US, A, 3,912,328 (Tanaka) 14 October 1975	1, 4
A	DE, A, 2,442,726 (Rutzki et al.) 25 March 1976	9, 11, 12 15, 25, 28
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>¹⁵ Special categories of cited documents: ¹⁵</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"Δ" document member of the same patent family</p> </div> </div>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search ¹	Date of Mailing of this International Search Report ¹	
30 December 1983	27 JAN 1984	
International Searching Authority ¹	Signature of Authorized Officer ¹⁶	
ISA/US	J. Brittain <i>James R. Brittain</i>	

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

24/605B, 71SB, 163K, 171, 194, 199, 255A,
323;
24/572-574, 588, 592, 598, 602, 608-616, 620
631, 633, 636, 637, 639-642, 645, 647-650,
653, 656, 658, 662, 704 (All U.S. only)

V. ☒ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE ¹⁰

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers _____, because they relate to subject matter ¹² not required to be searched by this Authority, namely:

2. ☒ Claim numbers 6, 8, because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out ¹³, specifically:

Claim 6 is incomplete.

Claim 8 is not in proper dependent form.

VI. ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING ¹¹

This International Searching Authority found multiple inventions in this international application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

Remark on Protest

☐ The additional search fees were accompanied by applicant's protest.

☐ No protest accompanied the payment of additional search fees.

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